

# CORRESPONDENCE

## Genetics of Intellect

To the Editor, *Eugenics Review*

SIR,—Dr. Hurst's answers to my criticisms of his paper on "The Genetics of Intellect" are most satisfactory.\* The grading of his chief population (the Leicestershire families) was, according to his reply, far more adequate than I had gathered from his original paper. I am glad to hear, also, that he would not put much trust in the data from the other population (the Royal Families—whose gradings seemed to me very unreliable), but only regards them as accessory.

There is still some confusion over the question of the distribution of grades of intellect. Measurements of intellect certainly *do* conform to the normal frequency distribution curve, but, as Dr. Hurst points out, they *do not* conform to a distribution whose total I.Q. range is 0 to 200. Such a range would imply a standard deviation for the I.Q. of about 33. Actually there is some doubt as to the true S.D.; Terman found it to be as low as 13, others who work with Binet tests say 15, while those who employ group tests often obtain a figure of 25. Dr. Hurst's data may profitably be compared with the distributions that correspond to such standard deviations. (In the following table, I have combined his results for parents and children, and computed the percentages on the assumption of a symmetrical distribution about 100.)

Av'ge. I.Q.	L.F. data per cent.	S.D. = 13 per cent.	S.D. = 15 per cent.	S.D. = 25 per cent.
0	0.0	0.0	0.0	0.016
20	0.083	0.0	0.0	0.244
40	0.333	0.006	0.044	2.02
60	1.708	1.034	2.236	9.23
80	11.833	21.02	22.97	22.95
100	72.083	55.88	49.50	31.08
120	11.833	21.02	22.97	22.95
140	1.708	1.034	2.236	9.23
160	0.333	0.006	0.044	2.02
180	0.083	0.0	0.0	0.244
200	0.0	0.0	0.0	0.016

It will be seen that Dr. Hurst's data differ remarkably from all these three distributions. Applying Pearson's test for Goodness of Fit, it is found that the probability of the L.F. distribution is about 1 in 200, 1 in 3,000, and 1 in  $2 \times 10^{14}$ , according as the S.D. of the I.Q. is taken to be 13, 15 or 25. In other words, had the Leicestershire families been an unselected group, graded by objective tests, the obtained distribution might

possibly have occurred if the S.D. is 13, but would be almost inconceivable if the more likely S.D. of between 15 and 25 is accepted.

Fortunately, as Dr. Hurst states, genetical conclusions do not rest on the type of distribution of the population. Nor would I wish to press the point, because the I.Q. is an eminently unsatisfactory unit for statistical treatment. (No one seems to have discovered, as yet, what the S.D. of the distribution would be if intellect was graded in absolute units of equal value; though Thorndike has proved that even with such units the distribution still remains normal.) But the discrepancy is important for it must indicate either that Dr. Hurst's selection of families (cf. the first page of his article\*) was very unusual, in that he omitted so large a proportion of the 70-90 and 110-130 grades, or that there is still some unreliability present in his gradings. His genetical conclusions would, I think, be considerably reinforced if his formula was shown to apply also to objective gradings of a series of families, which conformed to a normal distribution curve of reasonable standard deviation.

May I trespass on your space further in order to comment on "the purely innate general ability" which Dr. Hurst evidently favours? I said that this conception was a legitimate psychological theory, but personally I doubt whether it is a very sensible one. What sort of intelligence would a man have who managed to survive in complete solitude from infancy on a desert island? As well ask, what sort of intelligence an amoeba would have if brought up as a family pet by highly intelligent human beings in a highly cultured environment! On such a theory the contributions of heredity and environment to adult intelligence can only be regarded as of equal importance. Thus the theory would actually appear disadvantageous to the geneticist, since he has no means of isolating this purely innate ability from its environmental addenda. Would it not be preferable, then, to give up the fiction of innate ability, to cease from contrasting heredity with environment, and instead to contrast *heredity-plus-an-average-environment* with *unusualness-of-environment*? This view accords much better than the other with Dr. Hurst's conviction that environmental factors only have a 10 per cent. influence on intellect. For we already know by experiment that ordinary ranges of unusualness-of-environment can only produce differences of about 10 points in an I.Q. of 100 (at the most 30 points); whereas it is also fairly certain that heredity-plus-an-average-environment can produce differences of at least 50 points either way in an I.Q. of 100, probably more. Though we cannot as yet measure unusualness

\* See *EUGENICS REVIEW*, July, 1934, pp. 164-166.

\* *EUGENICS REVIEW*, April, 1934, page 33.

(goodness or badness) or averageness of environment, to do so should be quite a practical problem. Different measures would, of course, have to be devised in each different country or cultural group. And given such a measure the psychologist could, metaphorically, subtract from the obtained I.Q. the proportion due to unusualness, leaving an approximate grading of pure intellect-due-to-heredity - plus - an - average - environment. I say "approximate grading," because I must still maintain the proviso that intellect is far too complex a psychological function ever to be completely delimited in quantitative terms.

My final question then is, will the geneticists, of whom Dr. Hurst is so able a representative, forgo their claims that genetical formulæ apply to innate ability, and apply them instead to some such concept as that outlined above? I anticipate much greater possibilities of fruitful co-operation between genetics and psychology along these lines than along the lines of the traditional, misleading distinction between purely innate and purely acquired factors.

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## The German Sterilization Law

To the Editor, *Eugenics Review*

SIR,—In his paper on the German Sterilization Law (July, 1934, p. 139), "Regierungsrat" writes: "Of principal importance in any individual case of sterilization are the two legal suppositions: (1) Sterilization is only permitted if the disease is diagnosed by a doctor as being hereditary, and (2) if the *Erbgesundheitsgericht* (court of hereditary health) comes to the conclusion that the descendants of the person to be sterilized will most probably be hereditarily diseased."

I regret that "Regierungsrat" has not mentioned the practice of the law. In *Die psychiatrische Aufgaben bei der Ausführung des Gesetzes zur Verhütung erbkranken Nachwuchses*, by K. Bonhoeffer, Berlin, 1934 (Psychiatric problems involved in carrying out the law for the prevention of the transmission of hereditary diseases), he may read the following statement (p. 32): "Wie wir gesehen haben, kann man in 80 % der Fälle mit Erblichkeit rechnen, ausserdem sind viele der aus äusseren Ursachen Erbkranken erblich belastet, so dass man praktisch jeden Schwachsinnigen sterilisieren kann, wenn nicht die exogene Bedingtheit erwiesen ist." (As we have observed, we can reckon on hereditary causes in 80 per cent. of the cases: in addition, many people who suffer from transmissible diseases caused by factors in the environment are, at the same time, hereditarily afflicted, so that practically every mental defective can be sterilized, unless exogenous causes for his condition can be proved.) And on p. 44: "Wenn man mehr die Bestrebungen, die im Gesetz liegen,

weniger den Wortlaut wirken lässt, so ist zu erwarten, dass auch in Fällen von vereinzelter Schizophrenie, ohne dass der Nachweis weiterer Erbschäden in den Sippen geführt ist, Unfruchtbarmachung beschlossen wird. Dann wurde es so sein, dass in jedem Falle von erwiesener Schizophrenie auf Sterilisierung erkannt wird, wenn der Kranke fortpflanzungsfähig ist. Zu solch einer Durchführung des Gesetzes werden die Erbgesundheitsgerichte ermutigt durch einen Satz der amtlichen Begründung zu § 1. Dieser lautet: Ein Verlust wertvollen Erbgutes ist bei den in Frage kommenden Erbkranken nicht zu befürchten." (If one considers the aims of the law rather than its phrasing, it is to be expected that even in single cases of schizophrenia, without a proof of further affliction in their respective families, sterilization would be approved of. Then sterilization would be agreed upon in all cases of proved schizophrenia, if the diseased person were capable of reproduction. The Courts of Hereditary Health are encouraged to interpret the law in this way by a sentence in the official preamble to § 1. It reads as follows: "With the hereditarily diseased persons in question, a loss of valuable hereditary characteristics need not be feared.") At the Eugenics Conference held last month in Zürich I asked Professor Rüdin's opinion about these quotations. He agreed that they correctly expressed the prevailing practice and justified them on the two following grounds: (1) In some cases the heredity of the illness cannot be proved because the family of the patient is not known. (2) The investigation of the heredity of the illness would take too long in many cases.

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## The Decline in Population

To the Editor, *Eugenics Review*

SIR,—The pessimists who are predicting a diminishing population fail to consider that such a population is an evil which may cure itself, as the women unable or unwilling to bear children will leave no descendants, while the women able and willing to become mothers will leave descendants likely to inherit their ability and desire to increase and multiply.

The present low birth-rate is undoubtedly a serious matter, and if it continues for several generations the entire population is likely to suffer, as at present a strong, healthy woman who should be capable of bringing a large number of healthy children into the world has a family usually no larger than that of the woman who after bearing two or three children dies of cancer, tuberculosis, or some other disease.

For many centuries our population increased even less rapidly than at present, but as this was due not to a low birth-rate, but to an abnormally high death-rate among the lower elements of the